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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/723,152	11/27/2000	Essam A. Sourour	4015-784	3612

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EXAMINER

DEPPE, BETSY LEE

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/723,152

Applicant(s)

SOUROUR, ESSAM A.

Examiner

Betsy L. Deppe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7,10-19 and 25-27 is/are rejected.
- 7) ☒ Claim(s) 2,4,8,9,20-24 and 28-32 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed April 2, 2004 have been fully considered but they are not persuasive.

2. With regard to applicant's argument on page 18 that the 35 USC 112 rejection of claim 17 (and dependent claims 18 and 19) is improper, the argument is not persuasive and the Examiner maintains the rejection of claims 17-19 under 35 USC 112. For example, the phrase "wherein the at least one primary RAKE finger comprises a plurality of primary RAKE fingers" is indefinite because it is unclear whether the claimed limitation covers a plurality of primary RAKE fingers. Or whether it includes multiple primary RAKE fingers (since "the at least one primary RAKE finger" may be more than one) wherein each of these primary RAKE fingers are further comprised of RAKE fingers. This rejection may be overcome by changing "a plurality of primary RAKE fingers" to "a plurality of RAKE fingers" and inserting a word before "interference estimators" to differentiate it from "the at least one interference estimator."

3. With regard to applicant's argument on page 19 that Yugawa does not teach or suggest removing multipath interference estimates, Yugawa teaches "erasing" (i.e. "removing") the multipath components that is estimated and provided by unit 4 in Figure 6. (See column 6, lines 25-29)

4. With regard to applicant's argument on page 20 that Kansakoski does not cancel the multipath pilot channel interference from the pilot channel itself, in Figure 2 of Kansakoski, the interference estimates from 34 and pilot signal 102 are provided to subtractor 130. Therefore, the multipath pilot channel interference is subtracted or canceled from the pilot channel itself. (See also column 4, lines 28-32)

Furthermore, with regard to the applicant's argument on page 21 that the present invention does not address interference in the pilot signal, the claimed subject matter does not limit the "received composite signal" to a data signal. Therefore, Kansakoski reads on the claimed invention.

5. With regard to applicant's argument on page 21 that Kansakoski does not disclose a time offset and that equation 4 does not reveal a delay difference between two multipath signals, Kansakoski discloses that " τ represents the path delay" in column 3, lines 48-49. It is implicit that the path delay corresponds to a time offset between the multipath signals.

6. With regard to applicant's argument regarding claims 16 and 27 (see page 21), Kansakoski teaches canceling the multipath pilot channel interference from the pilot channel itself. (See Figure 2 and column 4, lines 28-32) Therefore, it anticipates claims 16 and 27.

Drawings

7. The drawings were received on April 2, 2004. These drawings are approved.

Specification

8. The specification is objected to because the Brief Description of the Drawings do not include Figure 7A that was added by the amendment.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 17 –19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 17, "the at least one primary RAKE finger comprises a plurality of primary RAKE fingers" on lines 1-2 and "the at least one interference estimator comprises a plurality of interference estimators" on lines 4-5 are confusing. It is unclear whether there is one primary RAKE finger or a plurality of primary RAKE fingers. Furthermore, it is unclear whether there is one interference estimator or a plurality of interference estimators.

Claim Rejections - 35 USC § 102

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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12. Claims 1, 3, 6, 7, 16, 17, 19 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Yugawa (US Patent No. 6,233,272 B1 cited in the Office Action mailed February 17, 2004, Paper No. 3).

13. With regard to claims 1, 3, 6, 7, 16, and 17, Figure 3 of Yugawa discloses the claimed invention correlating the received composite signal ("1-3" and Figure 5) to recover a signal of interest, correlating/determining multipath interference estimates ("4" and Figure 6) and subtracting the multipath interference estimate from the signal of interest (10). (See also column 6, lines 25-48; column 7, lines 3-37; column 8, lines 58-62; column 9, lines 13-16 and column 9, line 61 – column 10, line 27)

14. With regard to claim 19, Yugawa discloses the claimed invention including a plurality of interference estimate scalars. In Figure 6, amplifier 305 scales the interference estimate before it is subtracted from the signal of interest. If there are multiple "unnecessary component demodulator unit (4)" (see column 6, lines 45-48), there must necessary be multiple amplifiers with different levels thereby forming a plurality of interference estimate scalars and reading on the recited limitation.

15. With regard to claim 27, Yugawa discloses the claimed invention including the mobile terminal comprising a user interface, a transmitter and a receiver. Since Yugawa discloses using the receiver for mobile communications, it is inherent that a mobile terminal has the recited user interface and transmitter. As explained with regard to claim 16 above, Yugawa discloses the recited receiver.

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16. Claims 1, 3, 6, 14-17, 19 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Kansakoski et al. (US Patent No. 6,570,909 B1 cited in the Office Action mailed February 17, 2004, Paper No. 3).

17. With regard to claims 1, 3, and 6, Figure 2 of Kansakoski et al. discloses the claimed invention including correlating the received composite signal ("100") to recover a signal of interest, correlating/determining multipath interference estimates ("104-112") and subtracting the multipath interference estimate from the signal of interest ("130" and/or "132"). (See also column 3, line 62 – column 4, line 11)

18. With regard to claims 14 and 15, Kansakoski et al. discloses the claimed invention including the recited limitations. (See column 1, line 66 – column 2, line 46)

19. With regard to claims 16 and 17, Figures 1 and 2 of Kansakoski et al. discloses the claimed invention including at least one primary RAKE finger, at least one interference estimator, and a subtraction circuit wherein there are a plurality of primary RAKE fingers and a plurality of interference estimators.

20. With regard to claim 19, Figure 2 of Kansakoski et al. discloses a plurality of interference estimate scalars ("72-80").

21. With regard to claim 27, Kansakoski et al. discloses the claimed invention including the mobile terminal comprising a user interface, a transmitter and a receiver. (See column 1, lines 7-33) It is inherent that a mobile terminal has the recited user interface and transmitter.

Claim Rejections - 35 USC § 103

22. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

23. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yugawa. Yugawa discloses the claimed invention except for determining a value for the scaling factor that maximizes the signal-to-noise plus interference ratio of the signal of interest. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine a value for the scaling factor that maximizes the signal-to-noise plus interference ratio of the signal of interest in order to increase the likelihood of accurately recovering the transmitted data.

24. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yugawa as applied to claim 6 above, and further in view of Yellin (US Patent No. 6,034,986 cited in the Office Action mailed February 17, 2004, Paper No. 3). Although Yugawa teaches using multiple unnecessary demodulation units (4) (see column 6, lines 45-48), it does not explicitly teach how the multiple outputs are subtracted from the combined circuit. Yellin teaches determining the total interference effect before subtracting the interference effect from a combined RAKE signal (see Figures 1 and 3).

Since the multipath erasing unit (10) provides the same result regardless of whether a combined interference signal is inputted or multiple interference signals are inputted, it would have been an obvious matter of design choice to one of ordinary skill

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in the art at the time the invention was made to combine the outputs of multiple unnecessary demodulation units (4) to determine the total interference and subtract the total interference from the combined RAKE signal in Yugawa. Whether a combiner or a multipath erasing unit (10) with more inputs are used depends on considerations such as the availability of the requisite components.

25. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yugawa as applied to claim 17 above, and further in view of Yellin. Although Yugawa teaches using multiple unnecessary demodulation units (4) (see column 6, lines 45-48), it does not explicitly teach how the multiple outputs are subtracted from the combined circuit. Yellin teaches determining the total interference effect before subtracting the interference effect from a combined RAKE signal (see Figures 1 and 3).

Since the multipath erasing unit (10) provides the same result regardless of whether a combined interference signal is inputted or multiple interference signals are inputted, it would have been an obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to combine the outputs of multiple unnecessary demodulation units (4) to determine the total interference and subtract the total interference from the combined RAKE signal in Yugawa. Whether a combiner or a multipath erasing unit (10) with more inputs are used depends on considerations such as the availability of the requisite components.

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26. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yugawa as applied to claim 16 above, and further in view of Yellin. Although Yugawa teaches using multiple unnecessary demodulation units (4) (see column 6, lines 45-48), it does not explicitly teach how the multiple outputs are subtracted from the combined circuit. Yellin teaches generating a noise-reduced signal by either (a) determining the total interference effect before subtracting the interference effect from a combined RAKE signal (see Figures 1 and 3) or (b) using a set of individual differencing circuits to subtract each interference component and then a post-subtraction combining circuit (see Figure 3B).

Since either technique produces the same resultant signal, it would have been an obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to use a set of individual differencing circuits and a post-subtraction combining circuit in Yugawa when multiple unnecessary demodulation units (4) are used. Whether a combiner or a set of individual differencing circuits are used are based on considerations such as the availability of the requisite components.

Allowable Subject Matter

27. Claims 2, 4, 8, 9, 20-24 and 28-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsy L. Deppe whose telephone number is (703) 305-4960. The examiner can normally be reached on Monday, Tuesday and Thursday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Betsy L. Deppe
Primary Examiner
Art Unit 2634